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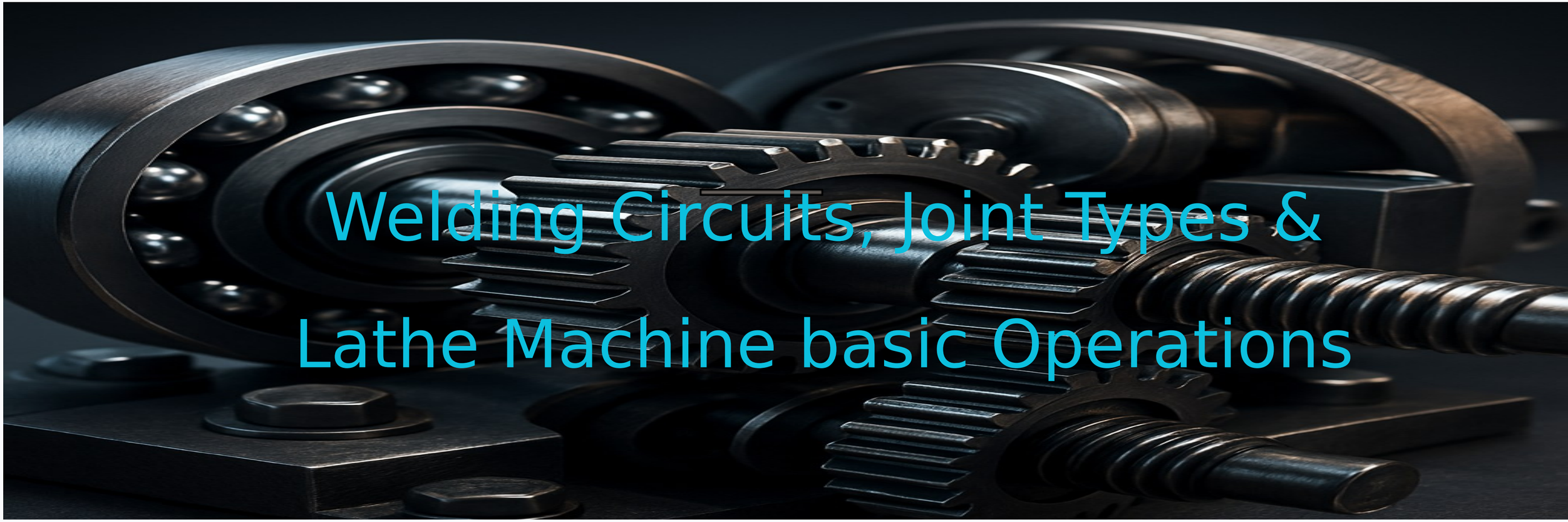
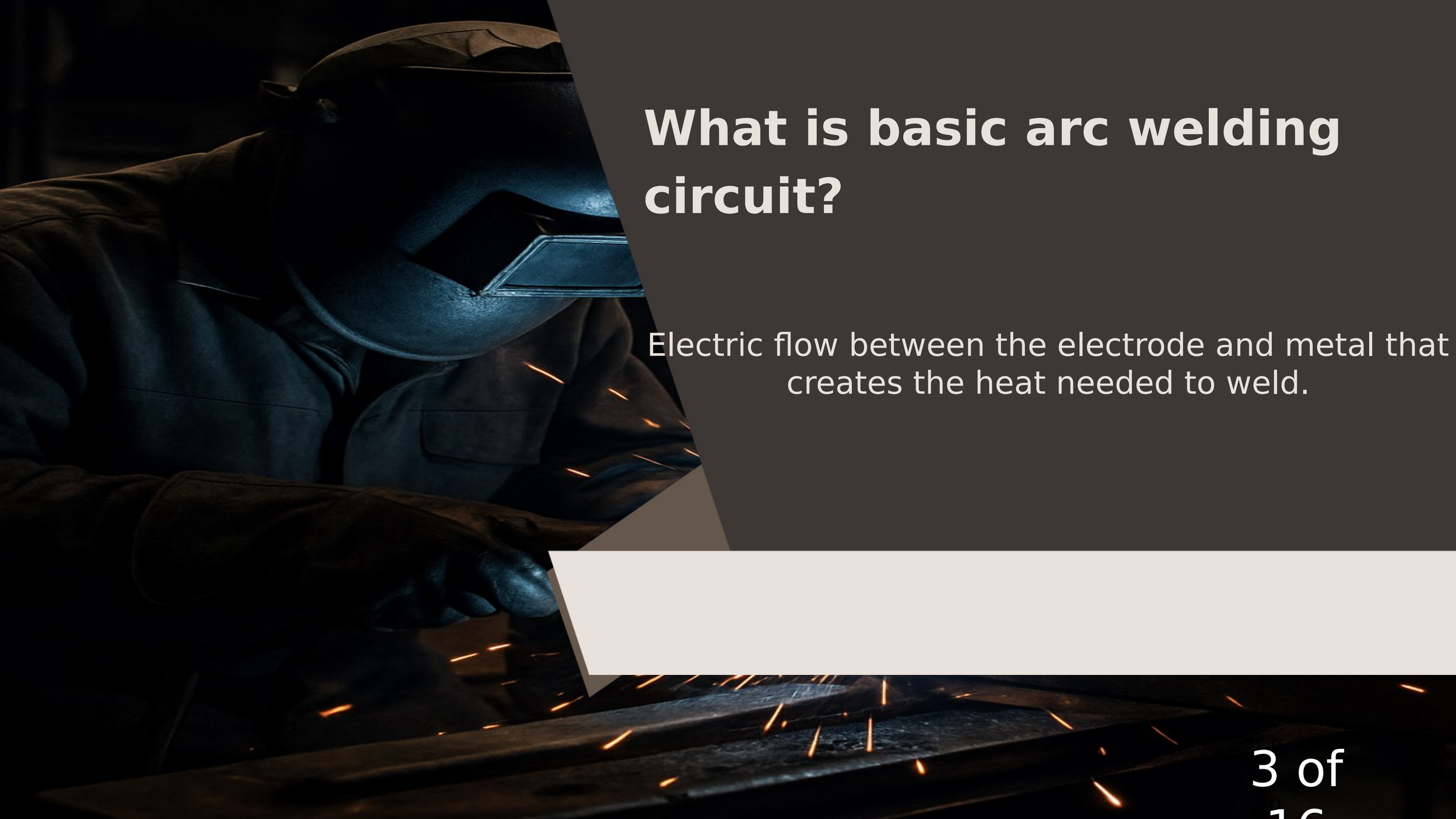


Welding Circuits, Joint Types & Lathe Machine basic Operations

Part 1

The Basic Welding Circuit



What is basic arc welding circuit?

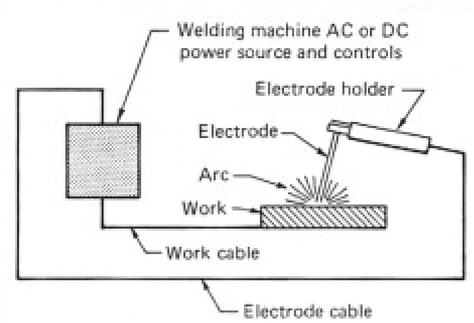
Electric flow between the electrode and metal that creates the heat needed to weld.

Components of an Arc Welding Circuit

Key Elements

- **Power Source:** Provides AC or DC current (Amperage/Voltage).
- **Electrode Holder & Electrode:** Holds the consumable or non-consumable stick/wire.
- **Workpiece:** The base metal being welded.
- **Ground Clamp:** Completes the electrical circuit back to the power source.

The arc is generated when the circuit is completed through the air gap, creating intense heat (~6500°F).



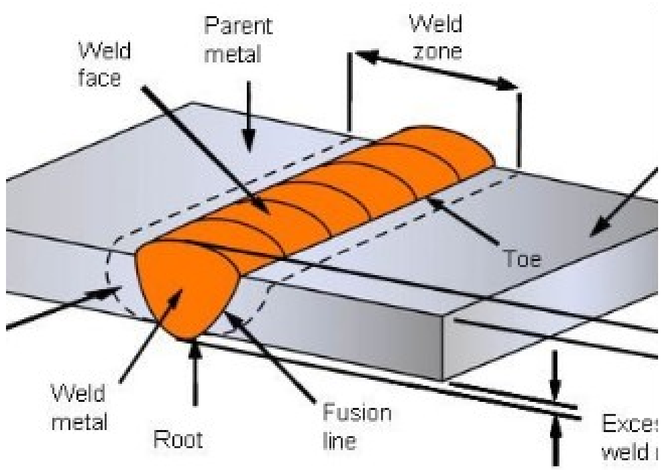
Part 2

Types of Welding Joints

WELDING JOINT TYPE

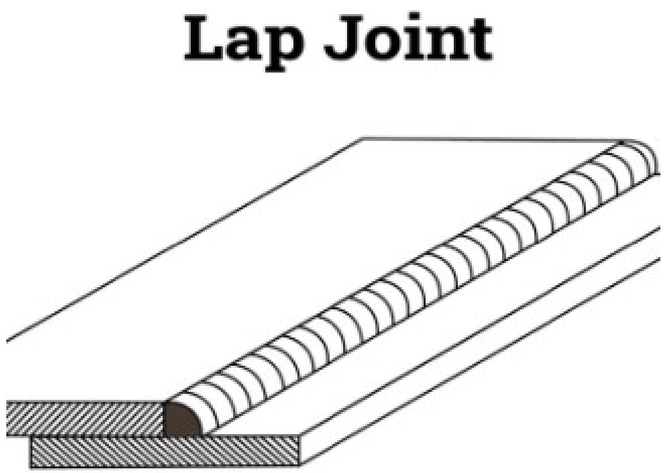
Types of Welding Joints: Butt, Edge, Corner, TEE, Lap

Standard Welding Joints (1/2)



Butt Joint

Two pieces joined in the same plane. Common for pipes and plate joining.



Lap Joint

Two overlapping pieces. High strength, often used without edge preparation.

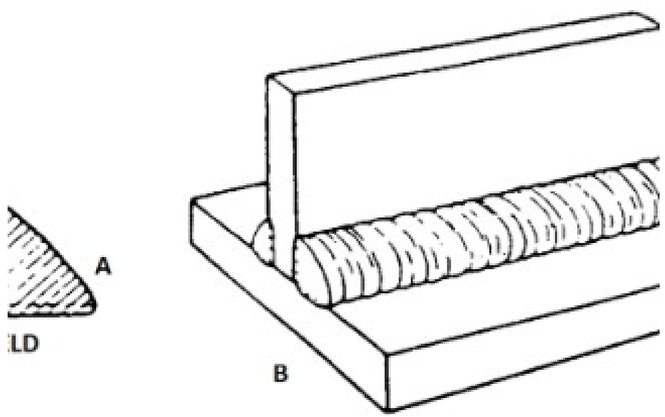
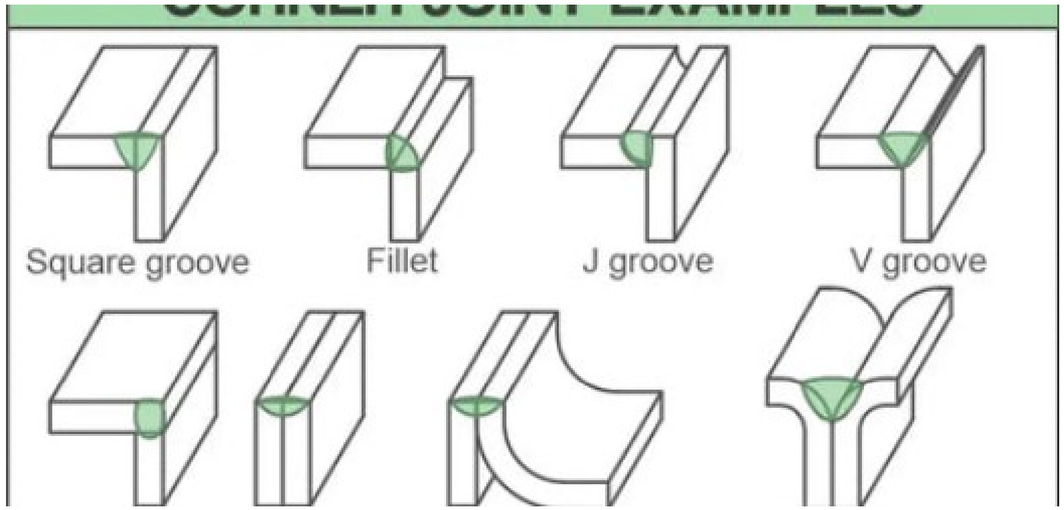


Figure 1: Tee joint - single pass fillet weld.

Tee Joint

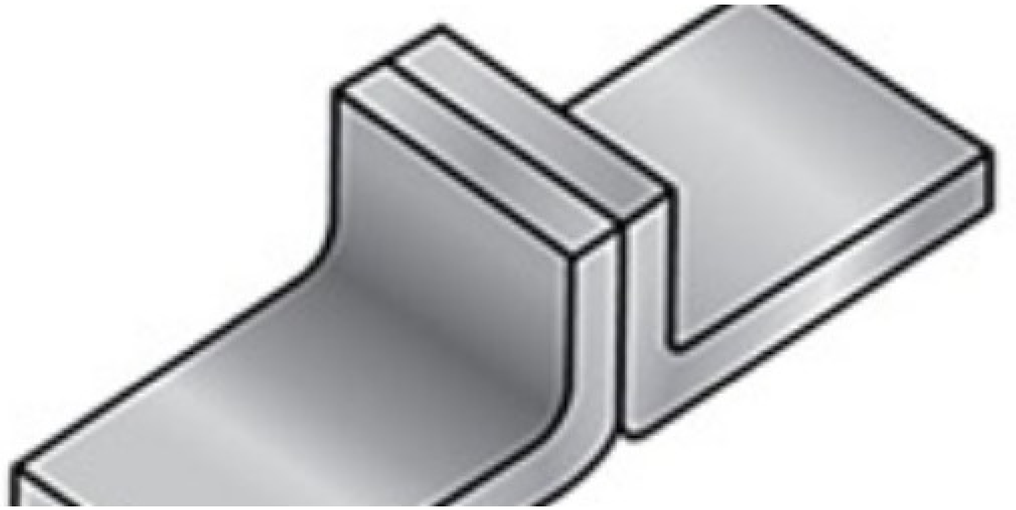
Two parts intersecting at a 90° angle. Requires a fillet weld.

Standard Welding Joints (2/2)



Corner Joint

Parts meet at a corner (L-shape). Common in box frames and tanks.



Edge Joint

Parallel edges joined together. Used for thin sheets or stiffening.

Part 3

Lathe Machine Cutting Tools

lathe Machine

1440s

A lathe machine is a tool that spins a piece of material so it can be shaped or cut.

Overview of Lathe Operations

Turning & Facing

Removing material from the outer diameter (Turning) or the end face (Facing) to size the part.

Hole Making

Using **Drilling** to create holes and **Boring** to enlarge/finish internal diameters.

Detailed Features

Creating **Threads**, **Grooves**, **Knurls** (texture), and **Parting Off** finished pieces.

Turning & Facing Tools

- **Turning:** The most common operation.
- Reduces the diameter of the workpiece.
  - *Roughing Tools:* Remove bulk material quickly.
  - *Finishing Tools:* Create smooth surface finish and final tolerance.
- **Facing:** Cuts a flat surface perpendicular to the rotational axis (squaring the end).

Drilling & Boring Operations

Internal Material Removal

Drilling: A drill bit is held stationary in the tailstock while the workpiece rotates. Creates the initial hole.

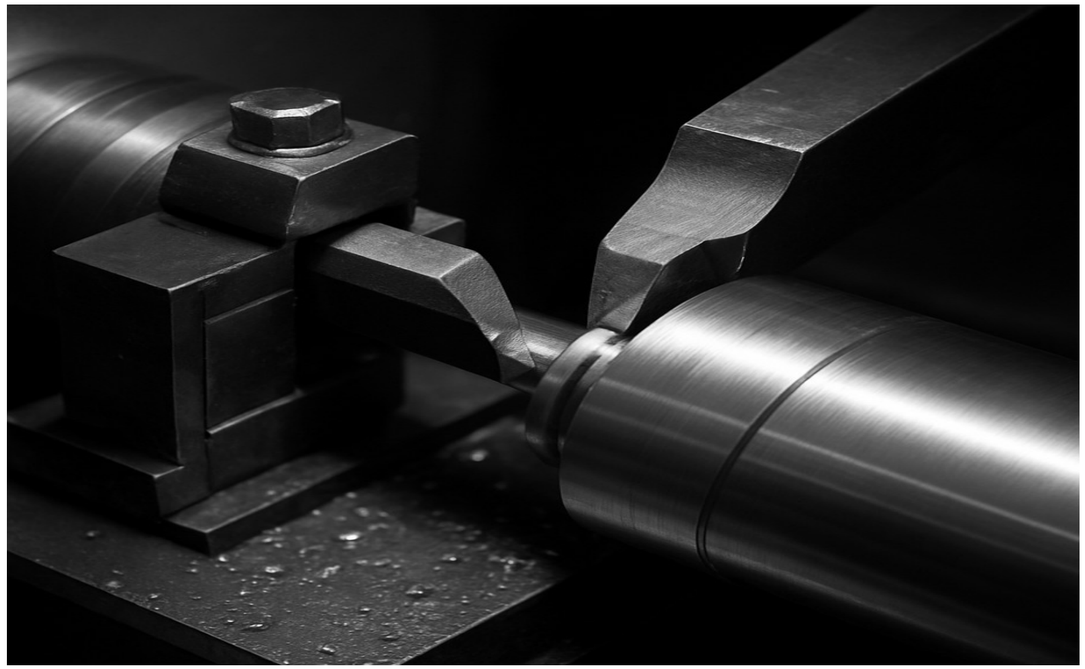
Boring: A single-point cutting tool (boring bar) enlarges an existing hole. It provides:

- Greater dimensional accuracy.
- Better concentricity.
- Ability to size non-standard holes.

Threading & Knurling

- **Threading:** Uses a tool with the specific thread profile (e.g., 60°) to cut helical grooves.
  - Can cut External (bolts) or Internal (nuts) threads.
- **Knurling:** A forming operation (not cutting). Presses a pattern of straight or diamond lines into the surface for better grip.

Parting (Cutoff) & Grooving



Material Separation

- **Parting Off:** A narrow blade tool plunges radially into the workpiece to sever the finished part from the raw stock bar.
- **Grooving:** Similar to parting but does not cut all the way to the center. Used for:
  - O-ring seats.
  - Oil channels.
  - Thread relief undercuts.

Questions?

Thank you for your attention.